

## DOCUMENT RESUME

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Testimony before the House Committee on Merchant Marine and Fisheries: Oceanography Subcommittee; by Wilbur D. Campbell, Associate Director, Community and Economic Development Div.

Contact: Community and Economic Development Div.

Organization Concerned: Department of the Navy; National Oceanic and Atmospheric Administration; National Science Foundation; Coast Guard.

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Previous GAO reports on Federal ocean programs discussed the number of activities involved, costs of programs, and lack of coordination. The most recent review in this area dealt with problems associated with operating federally owned and/or funded ocean research and survey vessels. In 1977, over \$126 million was spent to operate and maintain the oceanographic fleet which is composed of 60 oceanographic research vessels and 21 survey vessels. Federal oceanic activities are conducted by 21 organizations in 6 departments and 5 agencies. Vessels are funded, operated, and managed independently with no single agency having overall responsibility. There are no Government-wide policies or procedures for agencies to follow. Four issues which require resolution to improve the capability of the U.S. ocean fleet are: the need for a single manager of all U.S. oceanographic vessels, the need for uniform vessel accounting standards, the need for better coordination within the Department of the Navy, and the need for improving the National Oceanic and Atmospheric Administration's vessel management activities. Because of the growing awareness of the importance of ocean resources, other maritime nations have expanded efforts in ocean science. The Soviet Union has been improving its oceanographic capability through a comprehensive national ocean policy and program. The Soviet Union is more advanced in polar research, but the United States is still leading in overall oceanographic research. France and the United Kingdom have also engaged in comprehensive ocean programs with centralized management. (HTW)

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STATEMENT OF  
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BEFORE THE

SUBCOMMITTEE ON OCEANOGRAPHY  
HOUSE COMMITTEE ON MERCHANT MARINE AND FISHERIES

ON  
THE U.S. OCEANOGRAPHIC FLEET

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

WE ARE HERE TODAY AT YOUR INVITATION TO DISCUSS THE RESULTS OF OUR REVIEW OF OCEANOGRAPHIC ASSETS WHICH WAS EXPANDED, AT YOUR REQUEST, TO PROVIDE DATA ON THE OPERATION AND MANAGEMENT OF THE U.S. OCEANOGRAPHIC FLEET AND TO COMPARE THE U.S. CAPABILITY WITH THAT OF OTHER MAJOR NATIONS. WE HAVE NOT YET FINALIZED OUR REPORT AND ALTHOUGH WE OBTAINED INPUT FROM RESPONSIBLE PROGRAM MANAGERS, FORMAL AGENCY COMMENTS WERE NOT OBTAINED ON OUR TENTATIVE CONCLUSIONS AND RECOMMENDATIONS.

BECAUSE OF CONGRESSIONAL CONCERN OVER THE USES OF THE OCEAN AND ITS POTENTIAL CONTRIBUTION TO WORLD PEACE AND THE QUALITY OF LIFE, WE ISSUED, ON FEBRUARY 25, 1975, AT THE REQUEST OF THE SENATE COMMITTEE ON COMMERCE, OUR FIRST REPORT TO THE CONGRESS DEALING WITH FEDERAL OCEANIC ACTIVITIES, ENTITLED "FEDERAL AGENCIES ADMINISTERING PROGRAMS RELATED TO MARINE

SCIENCE ACTIVITIES AND OCEANIC AFFAIRS" (GGD-75-61). THIS REPORT DISCUSSED AND DESCRIBED FEDERAL OCEAN PROGRAMS AND FOUND THAT 21 ACTIVITIES IN SIX DEPARTMENTS AND FIVE AGENCIES WERE CONDUCTING MARINE SCIENCE ACTIVITIES AT A COST OF OVER \$1.6 BILLION IN 1975.

ON OCTOBER 10, 1975, WE ISSUED A SECOND REPORT TO THE CONGRESS RELATED TO FEDERAL OCEANIC PROGRAMS ENTITLED "NEED FOR A NATIONAL OCEAN PROGRAM AND PLAN" (GCD-75-97). THIS REPORT DISCUSSED PROBLEMS THAT HINDERED EFFECTIVE FEDERAL MANAGEMENT OF MARINE SCIENCE ACTIVITIES AND OCEANIC AFFAIRS AND DESCRIBED THE ATTEMPTS THAT WERE BEING MADE TO ACHIEVE COORDINATION IN FEDERAL OCEANIC PROGRAMS. WE POINTED OUT THAT EXPERTS DISAGREED ON THE EFFECTIVENESS OF THE FEDERAL OCEAN PROGRAMS AND THAT IT WAS DOUBTFUL THAT THE RESOURCES OF THE 21 ACTIVITIES IN 11 DEPARTMENTS AND AGENCIES WERE BEING APPLIED IN A MANNER TO BEST SERVE NATIONAL PURPOSES.

TODAY WE WILL DISCUSS OUR THIRD EFFORT IN FEDERAL OCEANIC AFFAIRS AND ADDRESS SOME OF THE PROBLEMS ASSOCIATED WITH OPERATING FEDERALLY OWNED AND/OR FUNDED OCEAN RESEARCH AND SURVEY VESSELS. IN ADDITION, WE WILL PROVIDE SOME COMPARATIVE DATA ON THE OCEANOGRAPHIC CAPABILITY OF THE SOVIET UNION, FRANCE, AND THE UNITED KINGDOM.

#### ACTIVITIES OF THE NATION'S OCEANOGRAPHIC FLEET

RESEARCH AND MAPPING AT SEA REQUIRES SHIPS THAT ARE EQUIPPED WITH LABORATORIES, WINCHES, SPECIAL NAVIGATION EQUIPMENT, COMPUTERS, AND OTHER DEVICES WHICH MAKE THEM SUITABLE

FOR OCEANOGRAPHIC WORK. ONCE IN OPERATION, THESE VESSELS MUST BE EFFICIENTLY OPERATED, ADEQUATELY MAINTAINED, AND WHEN THEIR USEFUL LIFE IS ENDED, THEY MUST BE REPLACED IF NECESSARY.

OCEANOGRAPHIC VESSEL USES AND RELATED AGENCY MISSIONS CAN BE COLLECTIVELY DESCRIBED UNDER THREE BROAD CATEGORIES-- OCEAN SCIENCE, OCEANOGRAPHIC AND HYDROGRAPHIC SURVEYS, AND OCEAN ENGINEERING AND DEVELOPMENT.

IN 1977, OVER \$126 MILLION WAS SPENT TO OPERATE AND MAINTAIN THIS NATION'S OCEANOGRAPHIC FLEET WHICH IS COMPOSED OF 60 OCEANOGRAPHIC RESEARCH VESSELS AND 21 SURVEY VESSELS. APPENDIX I TO THIS STATEMENT PROVIDES A COMPLETE INVENTORY OF THE FLEET AND SOME OF ITS DESCRIPTIVE CHARACTERISTICS. APPENDIX II PROVIDES COST AND UTILIZATION DATA. THE FLEET IS OPERATED AND/OR FUNDED PRIMARILY BY FOUR FEDERAL AGENCIES.

--OCEANOGRAPHER OF THE NAVY,

--NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA),

--NATIONAL SCIENCE FOUNDATION (NSF), AND THE

--UNITED STATES COAST GUARD (USCG).

#### ISSUES AND PROBLEMS IN MANAGING THE NATION'S OCEANOGRAPHIC FLEET

THE UNITED STATES HAS NO COMPREHENSIVE NATIONAL OCEAN PROGRAM OR PLAN. FEDERAL OCEANIC ACTIVITIES ARE CONDUCTED BY 21 ORGANIZATIONS IN SIX DEPARTMENTS AND FIVE AGENCIES. OCEANOGRAPHIC VESSELS OPERATED TO SUPPORT THESE ACTIVITIES ARE FUNDED, OPERATED, AND MANAGED INDEPENDENT OF ONE ANOTHER

WITH NO SINGLE AGENCY HAVING RESPONSIBILITY FOR THE OVERALL COORDINATION OR MANAGEMENT OF THE FLEET OR ITS OPERATIONS. THESE ARE NO GOVERNMENT-WIDE POLICIES OR PROCEDURES FOR AGENCIES TO FOLLOW.

IN EXAMINING THE RECORDS OF THE VARIOUS AGENCIES AND DEPARTMENTS MANAGING AND OPERATING OCEANOGRAPHIC VESSELS WE FOUND NUMEROUS EXAMPLES OF A LACK OF COORDINATION AS WELL AS GENERAL DECLINE IN THE U.S. CAPABILITY TO CONDUCT OCEAN RESEARCH ABOARD FEDERALLY OWNED AND FEDERALLY FUNDED VESSELS. FOR EXAMPLE, DURING THE PERIOD OF 1970 THROUGH 1976, SOME AGENCIES WERE MOTHBALLING AND GIVING UP SHIPS AT THE SAME TIME THAT OTHER AGENCIES WERE BUILDING OR LEASING SHIPS TO MEET OCEANOGRAPHIC RESEARCH NEEDS. FOR THE MOST PART, THESE PROBLEMS RESULTED FROM THE LACK OF COORDINATION BETWEEN RESPONSIBLE FEDERAL AGENCIES AND THE LACK OF A UNIFIED NATIONAL OCEAN POLICY.

WE NOTED FOUR ISSUES DURING OUR REVIEW WHICH NEED TO BE ADDRESSED IN ORDER TO IMPROVE THE CAPABILITY OF THE U.S. OCEANOGRAPHIC FLEET.

- THE NEED FOR A SINGLE MANAGER OF ALL U.S. OCEANOGRAPHIC VESSELS;
- THE NEED FOR UNIFORM VESSEL ACCOUNTING STANDARDS;
- THE NEED FOR BETTER COORDINATION WITHIN THE DEPARTMENT OF THE NAVY; AND
- THE NEED FOR IMPROVING NOAA'S VESSEL MANAGEMENT ACTIVITIES.

NEED FOR A SINGLE MANAGER OF  
ALL U.S. OCEANOGRAPHIC VESSELS

BECAUSE THERE IS NO SINGLE MANAGER OR DEPARTMENT RESPONSIBLE FOR THE MANAGEMENT OF THE NATION'S OCEANOGRAPHIC VESSEL ASSETS, THERE IS NO FORMAL OR SYSTEMATIC PLAN TO ASSESS AND DETERMINE THE NECESSARY LEVEL OF VESSEL OPERATIONS OR TO PLAN FOR THE REPLACEMENT, UPGRADING OR RETROFIT OF OCEANOGRAPHIC VESSELS. EACH AGENCY OPERATING OCEANOGRAPHIC VESSELS IS CONCERNED PRIMARILY WITH SATISFYING ITS OWN MISSION NEEDS RATHER THAN BROAD NATIONAL NEEDS.

THE OCEAN SCIENCE COMMUNITY RECOGNIZED THIS PROBLEM, AND IN 1975, THE CHAIRMAN OF THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY REQUESTED THE CENTER FOR NAVAL ANALYSIS (CNA) TO CONDUCT A STUDY OF THE PROJECTED ADEQUACY OF THE U.S. OCEAN SCIENCE ASSETS FOR FEDERAL OCEANIC PROGRAMS.

THE REPORT STEMMING FROM THIS STUDY POINTED OUT THAT:

- BECAUSE OF THE LACK OF SHIP OPERATING FUNDS, FEDERALLY OPERATED VESSELS WERE UNDERUTILIZED, AND OPTIMAL UTILIZATION LEVELS SHOULD BE DEVELOPED AND MAINTAINED;
- THE LACK OF A SYSTEMATIC PROGRAM FOR PLANNING VESSEL REPLACEMENTS COULD MEAN SERIOUS SHORTFALLS FOR THE 1980'S WHEN A NUMBER OF FEDERALLY OWNED SHIPS WILL BE RETIRED, AND
- GIVEN THE LEADTIME INVOLVED IN REPLACING RETIRED VESSELS, THE CONVERSION OF EXISTING HULLS AND/OR LEASING MAY BE SUITABLE TO MEET INCREASED VESSEL DEMAND.

OUR ANALYSIS OF EXISTING DATA SUPPORTS THESE EARLIER FINDINGS, AND WE CONCLUDE THAT THESE SAME PROBLEMS STILL EXIST TODAY. FOR EXAMPLE, WE COMPARED SEVERAL GROUPS OF OCEANOGRAPHIC VESSELS OF COMPARABLE SIZE AND CAPABILITIES OPERATED BY NAVY AND NOAA AS WELL AS THE ACADEMIC FLEET WHICH IS OPERATED BY VARIOUS UNIVERSITIES AND FOUND THAT OPPORTUNITIES EXISTED TO ACHIEVE ECONOMIES BY INCREASING THEIR DAYS AT SEA.

IN REGARD TO PROJECTED VESSEL NEEDS AND DEFICIENCIES, WE BELIEVE, BASED ON AGENCY PROJECTIONS AND OUR ANALYSIS OF THE CURRENT OVERALL CONDITION OF U.S. VESSELS, THAT THERE WILL BE A NEED TO REPLACE MANY OF THE OCEANOGRAPHIC VESSELS DURING THE 1980'S.

FURTHER, IN ORDER TO GUARANTEE MORE EFFECTIVE MANAGEMENT AND UTILIZATION OF FEDERAL CIVILIAN VESSEL ASSETS, WE BELIEVE THAT A SINGLE MANAGER OR A FORMALLY COORDINATED GROUP OF VESSEL MANAGERS FROM THE AGENCIES INVOLVED SHOULD BE APPOINTED. THIS MANAGER OR GROUP OF MANAGERS SUCH AS A GOVERNMENT-WIDE FLEET ALLOCATION COUNCIL, COULD ASSESS AND DETERMINE TOTAL U.S. OCEANOGRAPHIC NEEDS BASED ON THE REQUIREMENTS OF ALL MARINE SCIENCE AND OCEANOGRAPHIC PROGRAMS MANAGED WITHIN THE RESPECTIVE AGENCIES. THIS WOULD PERMIT THE ESTABLISHMENT OF A UNIFORM REPLACEMENT POLICY FOR MEETING NATIONAL NEEDS AND THE DEVELOPMENT OF EFFICIENT PROCEDURES FOR UTILIZING AND SHARING VESSEL ASSETS WITHIN THE MOST ECONOMICAL METHODOLOGY.

HOWEVER, IT WOULD BE DIFFICULT AT THIS TIME FOR ANY MANAGER TO DETERMINE THE RELATIVE EFFICIENCY AND ECONOMY OF THE VARIOUS VESSELS UNTIL A UNIFORM ACCOUNTING SYSTEM IS ESTABLISHED WHICH WOULD PROVIDE ADEQUATE DATA FOR VALID COMPARISONS OF VESSEL OPERATING COSTS.

NEED TO ESTABLISH UNIFORM  
VESSEL ACCOUNTING STANDARDS

COST IS A MAJOR CONSIDERATION IN EVALUATING MOST GOVERNMENT OPERATIONS AND OCEANOGRAPHIC VESSEL OPERATIONS ARE NO EXCEPTION. IF DERIVED BENEFITS AND VESSEL EFFICIENCY ARE TO BE DETERMINED FROM THE ASSOCIATED VESSEL COSTS, THEN IT IS IMPERATIVE THAT AGENCIES IDENTIFY PROPERLY WHAT COSTS ARE ASSOCIATED WITH OPERATING THEIR VARIOUS OCEANOGRAPHIC VESSELS. AS A MINIMUM, THERE SHOULD BE ENOUGH SIMILARITY AMONG THE VARIOUS AGENCY SYSTEMS TO ALLOW FOR REASONABLE COST COMPARISONS.

WE FOUND THAT EACH ACTIVITY OPERATING FEDERALLY OWNED OR FUNDED OCEANOGRAPHIC VESSELS HAD A DIFFERENT ACCOUNTING SYSTEM FOR DEFINING AND ACCOUNTING FOR VESSEL DAYS AT SEA AND THE ASSOCIATED COST PER DAY AND THAT THESE SYSTEMS HAVE THE POTENTIAL TO DISTORT REALISTIC COST COMPARISONS. FOR EXAMPLE, WHEN WE REVIEWED THE RECORDS AT THE NATIONAL SCIENCE FOUNDATION, WE FOUND THAT ACCOUNTING GUIDELINES HAD NOT YET BEEN DEVELOPED AND THERE WAS NO GUIDE FOR COST COMPARABILITY AMONG THE VARIOUS ACADEMIC INSTITUTIONS. OUR ANALYSIS ALSO REVEALED THAT NOAA HAD UNDERSTATED VESSEL COSTS BY AT LEAST 39 PERCENT OR \$1,500 PER DAY FOR TWO FISCAL YEARS. THIS RESULTED FROM



EXCLUDING PERSONNEL AND EQUIPMENT COSTS FOR SOME TYPES OF PROJECTS.

TO PROVIDE COST COMPARABILITY FOR EFFECTIVE VESSEL MANAGEMENT, WE BELIEVE A STANDARDIZED ACCOUNTING SYSTEM THAT WOULD CLASSIFY AND ACCOUNT FOR ALL DIRECT AND INDIRECT VESSEL COSTS SHOULD BE ESTABLISHED. UTILIZATION OF SUCH AN ACCOUNTING SYSTEM COULD ASSIST A VESSEL MANAGER TO BEST DETERMINE THE MOST ECONOMICAL AND EFFICIENT VESSEL OR VESSELS TO EMPLOY FOR THE VARIOUS OCEANOGRAPHIC PROGRAMS.

NEED FOR BETTER COORDINATION OF  
OCEANIC ACTIVITIES WITHIN THE NAVY

THE NAVY'S OCEANOGRAPHIC PROGRAM IS DIVIDED INTO THREE FUNCTIONAL AREAS: OCEAN SCIENCE, OCEAN ENGINEERING, AND OCEANOGRAPHIC OPERATIONS, WHICH INCLUDES ENVIRONMENTAL PREDICTION SERVICES. WHILE THESE FUNCTIONAL AREAS ARE CONCERNED PRIMARILY WITH THE NAVY'S NATIONAL SECURITY ROLE, THEY ARE ALSO AN IMPORTANT ELEMENT IN THE OVERALL FEDERAL OCEANOGRAPHIC EFFORT. BECAUSE THE NAVY IS INVOLVED IN MOST ASPECTS OF OCEAN RESEARCH, IT MAKES MAJOR CONTRIBUTIONS TO THE TOTAL FEDERAL EFFORT.

IN 1975, THE SECRETARY OF THE NAVY ISSUED A DIRECTIVE THAT WAS DESIGNED TO CONSOLIDATE THE NAVAL OCEANOGRAPHIC PROGRAM AND ITS RESOURCES UNDER A SINGLE MANAGER--THE OCEANOGRAPHER OF THE NAVY--AND TO INTEGRATE IT WITH OTHER NATIONAL OCEANOGRAPHIC EFFORTS. THE PURPOSE OF THIS DIRECTIVE WAS TO INSURE THAT NAVY OCEANOGRAPHIC PROGRAMS WOULD BE AS ECONOMIC

AND EFFICIENT AS POSSIBLE. THIS DIRECTIVE, HOWEVER, HAS NEVER BEEN FULLY IMPLEMENTED.

DURING OUR REVIEW OF THE NAVY'S OCEANOGRAPHIC PROGRAMS, WE FOUND THERE IS NOT CENTRALIZED MANAGEMENT NOR A SINGLE COORDINATION POINT WITHIN THE DEPARTMENT OF THE NAVY FOR OCEAN PROGRAMS, AND THERE IS A POTENTIAL DUPLICATION OF PROGRAM EFFORT. INEFFICIENT AND UNCOORDINATED PROGRAM AND VESSEL MANAGEMENT OFTEN RESULTS FROM HAVING THE NAVY'S FUNCTIONAL OCEANOGRAPHIC AREAS DISPERSED AMONG SEPARATE COMMANDS.

FOR EXAMPLE, WE NOTED THAT EVEN THOUGH THE OCEANOGRAPHER OF THE NAVY IS DESIGNATED AS THE CENTRAL MANAGER FOR ALL OCEANOGRAPHIC VESSELS AND RESOURCES, THE NAVAL RESEARCH LABORATORY, UNDER THE OFFICE OF NAVAL RESEARCH, CONTINUES TO USE BASIC RESEARCH AND DEVELOPMENT FUNDS TO OPERATE AN EXPENSIVE OCEAN RESEARCH VESSEL, THE USNS HAYES, WHILE VESSEL RESOURCES AND FUNDING DEFICIENCIES EXISTED IN SUPPORT OF OTHER HIGHER PRIORITY DEFENSE-RELATED OCEANOGRAPHIC OPERATIONS.

OUR VIEW THAT ALL NAVAL OCEANOGRAPHIC FUNCTIONS SHOULD BE CONSOLIDATED UNDER A SINGLE MANAGER IS SUPPORTED BY AN EVALUATION OF THE NAVAL OCEANOGRAPHIC PROGRAM DIRECTED BY THE VICE CHIEF OF NAVAL OPERATIONS, IN SEPTEMBER 1977. THE RESULTING NAVY STUDY POINTED OUT THAT OCEANOGRAPHY WITHIN THE DEPARTMENT WAS NOT COORDINATED AND CITED A NAVAL AUDIT REPORT THAT DESCRIBED THE NAVAL OCEANOGRAPHIC PROGRAM AS BEING FRAGMENTED.

NEED FOR IMPROVING NOAA'S  
VESSEL MANAGEMENT

DURING OUR REVIEW WE ALSO IDENTIFIED PROBLEMS WITH NOAA'S INTERNAL MANAGEMENT OF VESSEL OPERATIONS. FOR EXAMPLE, WE FOUND THERE IS NO NOAA REVIEW OF THE OCEANOGRAPHIC RESEARCH/SURVEY PROJECTS BEING PLANNED OR CONDUCTED BY OTHER FEDERAL AGENCIES OR UNIVERSITIES WITH THE EXCEPTION OF THE DEPARTMENT OF THE NAVY. NOAA OFFICIALS STATED THAT INFORMAL COORDINATION DOES EXIST, BUT AGREED THAT THERE IS A POTENTIAL FOR DUPLICATION OF EFFORT.

FURTHER EXAMINATION OF NOAA VESSEL OPERATIONS ALSO INDICATED THAT NOAA PROGRAM MANAGERS WERE LEASING VESSELS WITHOUT THE KNOWLEDGE OF NOAA'S OFFICE OF FLEET OPERATIONS. WHEN WE QUESTIONED FLEET OPERATION OFFICIALS CONCERNING NOAA'S VESSEL LEASE AND CHARTING COSTS, THEY COULD ONLY PROVIDE US WITH A "BEST ESTIMATE" OF THESE COSTS. WE BELIEVE THIS RESULTS FROM THE LACK OF EFFECTIVE CENTRALIZED CONTROL OVER VESSEL OPERATIONS WITHIN NOAA.

WE ALSO FOUND IN AT LEAST TWO INSTANCES, HIGH COST VESSELS WERE ASSIGNED TO PROJECTS WHICH NORMALLY USE LESS COSTLY VESSELS. NOAA OFFICIALS STATED THAT BECAUSE OF OTHER PRIORITY WORK AND SHIP MAINTENANCE REQUIREMENTS, THE LESS COSTLY VESSELS WERE UNAVAILABLE. HOWEVER, VESSELS WITH HIGH OPERATING COSTS WERE USED WITHOUT ATTEMPTING TO OBTAIN MORE ECONOMICAL VESSELS FROM OTHER AGENCIES OR THE PRIVATE SECTOR.

## COMPARATIVE ANALYSIS OF U.S. AND FOREIGN OCEANOGRAPHIC CAPABILITIES

FOR THE FIRST TWO DECADES FOLLOWING WORLD WAR II, THE U.S. NAVY PROVIDED THE PRINCIPAL WORLDWIDE SUPPORT AND LEADERSHIP FOR OCEAN PROGRAMS IN BOTH OCEAN SCIENCE AND ENGINEERING. ESSENTIALLY, THE NAVY'S PROGRAM WAS ALSO THE NATIONAL PROGRAM.

BEGINNING IN 1950, OTHER AGENCIES SUCH AS THE NATIONAL SCIENCE FOUNDATION SET UP OCEAN SCIENCE PROGRAMS REDUCING THE NEED FOR THE NAVY TO SUPPORT SIMILAR EFFORTS. WHILE THIS WAS TAKING PLACE, OTHER NATIONAL PRIORITIES SUCH AS THE "SPACE RACE" BETWEEN THE SOVIET UNION AND U.S. BEGAN TO DRAW ATTENTION AND SUPPORT AWAY FROM A DEVELOPING NATIONAL OCEAN PROGRAM JUST AS IT WAS GATHERING MOMENTUM. IN CONTRAST, BECAUSE SCIENTIFIC AND TECHNOLOGICAL ADVANCES SINCE WORLD WAR II HAVE DEMONSTRATED THE WORLD'S OCEANS ARE A MAJOR EXPLOITABLE SOURCE FOR LIVING AND NONLIVING RESOURCES, OTHER MAJOR FOREIGN MARITIME NATIONS HAVE EXPANDED THEIR NATIONAL EFFORTS IN OCEAN SCIENCE AND ENGINEERING AND POSSESS WELL COORDINATED COMPREHENSIVE NATIONAL OCEAN POLICIES AND PROGRAMS.

### SOVIET OCEANS DEVELOPMENT

THE SOVIET UNION RECOGNIZED, SOME 20 YEARS AGO, THE IMPORTANCE OF THE OCEANS AS A SOURCE OF ANIMAL PROTEIN AND RAW MATERIALS, AND THE ECONOMIC VALUE OF THE MERCHANT MARINE IN AN ERA OF EXPANDING TRADE. IT ALSO RECOGNIZED THE POLITICAL AND NATIONAL SECURITY OR STRATEGIC VALUE OF THE OCEANS.

ACCORDINGLY, TOP-LEVEL RECOGNITION OF THE GROWING IMPORTANCE OF THE OCEANS WAS TRANSLATED INTO A CAREFULLY DESIGNED OCEAN POLICY. MEASURED IN TERMS OF SCIENTIFIC PERSONNEL AND OCEANOGRAPHIC VESSELS, THE UNITED STATES WAS THE WORLD'S LEADER IN OCEANOGRAPHY UNTIL THE EARLY 1960'S WHEN THE RUSSIAN PROGRAM OF EXPANSION GOT WELL UNDERWAY. BY 1974, THE SOVIET UNION SURPASSED THE U.S. IN THE NUMBER OCEANOGRAPHIC TECHNICIANS AND IT IS KNOWN THAT THEY HAVE BUILT OVER 200 OCEANOGRAPHIC VESSELS--INCLUDING 70 VESSELS OF OVER 1,000 GROSS WEIGHT TONS COMPARED TO 39 IN THE U.S. FURTHER, EXPERTS INDICATE THAT THE SOVIET UNION HAS CONTINUED TO IMPROVE ITS OCEANOGRAPHIC CAPABILITY WITH THE CONSTRUCTION OF ADDITIONAL NEW SHIPS, QUALITATIVE IMPROVEMENTS IN ITS RESEARCH FLEET, AND CONTINUED INPUT OF TRAINED OCEANOGRAPHIC TECHNICIANS TO SUPPLEMENT THEIR TRAINED SCIENTISTS.

HOWEVER, ACCORDING TO THE OCEAN SCIENCE COMMUNITY, THE SOVIET UNION IS KNOWN TO BE BEHIND THE UNITED STATES IN INSTRUMENTATION TECHNOLOGY, A VITAL PART OF OCEANOGRAPHY THAT ENABLES SCIENTISTS TO COLLECT AND INTERPRET DATA. ALSO RUSSIAN OCEANOGRAPHERS DO NOT HAVE SOPHISTICATED SHIP-BORNE COMPUTERS AND OTHER ADVANCED OCEAN SCIENCE EQUIPMENT.

THE ONE AREA IN WHICH THE SOVIETS CLEARLY SURPASS THE U.S. OCEANOGRAPHIC EFFORT IS POLAR RESEARCH. THEY HAVE MAINTAINED AT LEAST FOUR ARTIC STATIONS WITH SCIENTIFIC PERSONNEL SUPPORTED BY A NUMBER OF POLAR RESEARCH SHIPS. IN CONTRAST,

THE U.S. OCCASIONALLY SUPPORTS ONE ARTIC ICE FLOW STATION AND HAS ONLY ONE RESEARCH SHIP COMMITTED TO POLAR RESEARCH.

ANOTHER AREA WHERE THE SOVIETS HAVE EXPANDED THEIR CAPABILITIES IS HYDROGRAPHY. ACCORDING TO THE INTERNATIONAL HYDROGRAPHIC ORGANIZATION ANNUAL YEARBOOK FOR 1978, THE SOVIETS POSSESS A FLEET OF 60 HYDROGRAPHIC VESSELS WHILE THE U.S. HAS ONLY 21 COMPARABLE SHIPS.

IN SUMMARY, IT APPEARS THAT THE REMARKABLE ACCOMPLISHMENTS OF THE SOVIET UNION IN DEVELOPING ITS OCEAN SCIENCE CAPABILITY HAS COME ABOUT FROM A COMPREHENSIVE NATIONAL OCEAN POLICY AND PROGRAM. EXPERTS POINT OUT THAT SOVIET ACHIEVEMENTS ARE THE RESULT OF CLEARLY DEFINED OBJECTIVES AND COORDINATION AND CENTRALIZATION OF THE MAJOR DECISIONS RELATED TO OCEAN ACTIVITIES AT HIGH ORGANIZATIONAL LEVELS IN THE GOVERNMENT. IN CONTRAST, IN THE UNITED STATES, RESPONSIBILITY FOR OCEAN SCIENCE ACTIVITIES ARE WIDELY SCATTERED AND OFTEN UNCOORDINATED. HOWEVER, IT SHOULD BE POINTED OUT THAT IN SPITE OF THE MASSIVE SOVIET EFFORT, MOST EXPERTS AGREE THAT THE QUALITY OF U.S. OCEANOGRAPHIC RESEARCH IS SECOND TO NONE.

#### FRENCH AND UNITED KINGDOM OCEANOGRAPHIC DEVELOPMENTS

BECAUSE THE UNITED KINGDOM AND FRANCE ARE ALSO DEPENDENT ON OCEAN RESOURCES, THEY TOO RECOGNIZED THE IMPORTANCE OF OCEANIC AFFAIRS AND THE WORLD COMPETITION INVOLVED IN THE EXPLORATION AND EXPLOITATION OF MARINE RESOURCES.

IN 1967, THE FRENCH GOVERNMENT DECIDED UPON A COMPREHENSIVE OCEAN POLICY AND PROGRAM AND CREATED A NATIONAL CENTER FOR THE EXPLOITATION OF THE OCEANS (CNEXO). BEFORE THE NATIONAL CENTER WAS CREATED FRANCE HAD MORE THAN 100 LABORATORIES, ACTIVITIES, OR SERVICES INDIVIDUALLY CONCERNED WITH OCEANOGRAPHY. IN ORDER TO AVOID PROGRAM DUPLICATION OR A FRAGMENTED EFFORT, THE FRENCH GOVERNMENT CREATED THE CENTER TO ACT AS A COORDINATOR FOR ALL OF FRANCE'S OCEANOGRAPHIC EFFORT INCLUDING OCEANS POLICY, OCEANOGRAPHIC VESSEL MANAGEMENT, OCEAN PROGRAM DEVELOPMENT AND MANAGEMENT, AND THE TRAINING OF SCIENTISTS AND ENGINEERS IN OCEAN EXPLORATION.

WE NOTED THAT THE CENTER HAS RESPONSIBILITY FOR MANAGING ALL FRENCH CIVILIAN OCEANOGRAPHIC VESSEL OPERATIONS. THROUGH CENTRALIZED MANAGEMENT THEY HAVE ACHIEVED AN AVERAGE OF OVER 275 DAYS AT SEA FOR THEIR SHIPS. BASED ON THE DATA WE ANALYZED, THEIR VESSEL COSTS ARE SIMILAR TO U.S. VESSELS THAT HAVE HIGH UTILIZATION RATES.

IN REGARD TO THE FRENCH MILITARY OCEANOGRAPHIC EFFORT, WE FOUND THAT ALTHOUGH THE FRENCH NAVY DOES NOT HAVE OCEAN PROGRAMS COMPARABLE TO THE SIZE AND SCOPE OF THE U.S., ALL OCEANOGRAPHIC VESSELS AND PROGRAMS ARE MANAGED BY THE FRENCH NAVAL HYDROGRAPHER.

IN 1965, THE BRITISH ESTABLISHED THE NATIONAL ENVIRONMENTAL RESEARCH COUNCIL, WHICH IS SIMILAR TO THE FRENCH NATIONAL CENTER. THE COUNCIL'S RESPONSIBILITY ENCOMPASSES ALL OF THE CIVILIAN SCIENTIFIC ACTIVITIES IN THE UNITED KINGDOM

INCLUDING MANAGEMENT OF ALL THE BRITISH CIVILIAN OCEANOGRAPHIC VESSELS. THEIR VESSEL UTILIZATION RATES ARE ALSO EFFICIENT, AVERAGING OVER 260 DAYS PER YEAR WITH COSTS THAT ARE COMPARABLE TO U.S. OCEANOGRAPHIC SHIPS.

WHEN WE EXAMINED THE BRITISH MILITARY OCEANOGRAPHIC PROGRAM, WE FOUND THAT IT TOO HAD BEEN CENTRALIZED UNDER THE BRITISH HYDROGRAPHER.

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IN SUMMARY, WE BELIEVE THE LACK OF A COORDINATING AND DEFINITIVE NATIONAL OCEAN POLICY, THE PROLIFERATION OF OCEAN-RELATED PROGRAMS AND VESSELS, TOGETHER WITH THE INCREASINGLY RAPID GROWTH OF THE MANY USERS OF THE OCEANS, HAS LED TO CONTINUED FRAGMENTATION OF IMPORTANT OCEAN AFFAIRS AND FUNCTIONS.

MANAGEMENT AND OPERATION OF OCEAN RESEARCH/SURVEY VESSELS IS STILL HIGHLY DECENTRALIZED THROUGHOUT THE FEDERAL GOVERNMENT. EACH AGENCY CONTINUES TO OPERATE INDEPENDENTLY WITH NO OVERALL GOVERNMENT-WIDE GUIDANCE AND VERY LIMITED REVIEW OF OCEANOGRAPHIC VESSEL OPERATIONS OUTSIDE THE PURVIEW OF THE INDIVIDUAL AGENCIES. AT THE SAME TIME, THERE ARE NO FORMAL OR SYSTEMATIC PLANS TO ASSESS AND DETERMINE THE NECESSARY LEVELS OF VESSEL OPERATIONS OR THE LEVEL OF OCEANOGRAPHIC VESSEL ASSETS NECESSARY FOR AN OVERALL U.S. NATIONAL PROGRAM.

IN ADDITION, INCOMPLETE AND INADEQUATE VESSEL ACCOUNTING SYSTEMS MAKE IT DIFFICULT TO DETERMINE AND COMPARE VESSEL COSTS WITH COSTS FOR SIMILAR SERVICES FROM OTHER AGENCIES AND



COMMERCIAL SOURCES. HENCE, IT IS DIFFICULT TO DETERMINE HOW AND BY WHOM OCEANOGRAPHIC VESSELS SHOULD BE OPERATED TO INSURE THE MOST EFFICIENT AND ECONOMIC COST TO THE GOVERNMENT.

WE BELIEVE THIS FRAGMENTED AND DECENTRALIZED USE OF OCEANOGRAPHIC VESSELS HAS CREATED A LACK OF OVERALL MANAGEMENT CONTROL AND CONTRIBUTED TO INEFFICIENT AND UNECONOMICAL USE OF THE NATION'S OCEAN RESEARCH/SURVEY FLEET AND THAT THERE IS A NEED FOR CENTRALIZED MANAGEMENT AND COORDINATION.

MR. CHAIRMAN, THIS CONCLUDES MY PREPARED STATEMENT, BUT WE SHALL BE GLAD TO RESPOND TO ANY QUESTIONS YOU MAY HAVE.

TABLE 1  
FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS AND RELATED CAPABILITIES

Agency/Institution Operating Vessel	Vessel length (feet)	Vessel Name	Age of Vessel (in Years)	Condition	Desired Retirement <sup>2/</sup>	SPECIAL CAPABILITIES <sup>1/</sup>						
						Mapping and Charting	Polar Operation	Controlled Positioning	Submersible Handling	Fisheries Research	Van Capable	
National Oceanic & Atmospheric Admin. (NOAA)	303'	Oceanographer	12	Excellent	1990	X						
	30'	Discover	12	Excellent	1990	X						
	276'	Researcher	8	Excellent	1994	X						
	292'	Surveyor	18	Fair/Good	1984	X						
	231'	Fairweather	10	Excellent	1992	X						
	231'	Rainier	10	Excellent	1992	X						
	215'	Miller Freeman	11	Excellent	1992					X		
	231'	Wt. Mitchell	11	Excellent	1991	X						
	163'	Peirce	15	Good	1986	X						
	163'	Whiting	15	Good	1986	X						
	175'	McArthur	12	Excellent	1989	X						
	175'	Davidson	11	Excellent	1990	X						
	170'	Oregon II	11	Excellent	1991					X		
	177'	George B. Kelez	34	Poor	1979							
	187'	Albatross II	16	Good	1985					X		
	164'	Townsend Cromwell	15	Good	1986					X		
	171'	David Starr Jordan	13	Excellent	1987					X		
	156'	Belovore II	10	Good	1991					X		
	133'	Ferrel	10	Excellent	1991					X		
	2/90'	Rude/Neck	17	Excellent	1987					X		
	100'	Oregon	32	Poor	1979					X		
	94'	John M. Cobb	28	Good	1980					X		
	86'	Hurre II	35	Poor	1980					X		
		George Bowers	23	Retired	Retired 12/6/76							
	University National Oceanographic Laboratory System (UNOLS)	245'	Melville	8	Good	1999			X			
		245'	Knorr	9	Good	2000			X			
210'		Atlantis II	15	Fair/Good	1993							
209'		Thomas Washington	13	Fair/Good	1995							
209'		Thompson	13	Fair/Good	1995							
208'		James M. Gillias	16	Good	1992							
208'		Robert D. Conrad	16	Poor/Fair	1983							
197'		Vema	55	Fair	1980							
177'		Oceanus	3	Excellent	2000							
177'		Wecoma	2	Excellent	2001							
177'		Endeavor	2	Excellent	2001							
172'		Neane Wave	5	Excellent	2003						X	
172'		Gyre	5	Good/Excellent	2003							
170'		Columbus Iselin	7	Excellent	2002						X	
156'		Kara Koiki	11	Fair	1988						X	
133'		Alpha Helix	13	Fair/Good	1988							
118'		Eastward	11	Fair/Good	1988							
110'		Valero IV	30	Fair	1983							
106'		Ridgely Warfield	11	Good	1993							
95'		Ellen B. Scripps	13	Good	1992							
85'		Azona	17	Fair/Good	1988							
80'		Cayuse	10	Good	1993							
80'		Longhorn	8	Good	1990							
72'		Blue Fin	6	Fair/Good	1985							
65'		Noh	35	Poor	1978							
65'		Osar	24	Poor	1980							
65'	Hurry	28	Poor	1980								
64'	Columus	8	Excellent	1990								

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						Mapping and Charting	Polar Operation	Controlled Positioning	Submersible Handling	Fisheries Research
U. S. Navy/Military Sealift Command (MSC)	246'	Mayes	7	Excellent	1991	X				
	455'	Bowditch	33	Poor	1978	X				
	455'	Dutton	33	Excellent	1985	X				
	563'	Ness	7	Excellent	1996	X				
	285'	Wyman	7	Excellent	1996	X				
	373'	Markness	7	Excellent	1996	X				
	373'	Chauvenet	8	Excellent	1996	X				
	215'	Bent	13	Good	1992	X				
	215'	Kane	12	Good	1992	X				
	215'	Kane	7	Excellent	1996	X				
	215'	Wilkes	7	Excellent	1996	X				
	208'	Bartlett	9	Good	1994					
	208'	De Steiguer	9	Good	1994					
	208'	Lynch	13	Good	1993					
	208'	Nizar	21	Good	1983		X	X		
	262'	Wizar	24	Fair	1986					
	455'	Kingsport	32	Fair	1994					
	370'	Myer	31	Fair	1995					
370'	Neptun	31	Fair	1994						
438'	Aeolus	33	Fair	1984						
United States Coast Guard (USCG) <sup>4/</sup>	180'	Evergreen	35	Fair	1985		X			
	2/213'	Acushnet	35	Fair	1985		X			
	269'	Northwind	33	Good	1987		X			
	269'	Westwind	33	Good	1985		X			
	269'	Westwind	33	Good	1978		X			
	269'	Burton Island	33	Good	1985		X			
	399'	Glacier	24	Good	1985		X			
	399'	Polar Star	2	Excellent	2000		X			
399'	Polar Sea	2	Excellent	2000						
Dept. of Interior: U.S. Geological Survey	180'	Sea Bumper	34	Good	1994	X				
	205'	Samuel Lee	10	Excellent	1979					
	96'	Polaris	49	Fair	1979					

<sup>1/</sup> Capabilities which cannot be readily added to an existing ship.

<sup>2/</sup> Based on data collected by Center for Naval Analysis in a study dated March, 1975.

<sup>3/</sup> Two ships utilized simultaneously for wire drag obstacle surveys.

<sup>4/</sup> All USCG vessels except the Evergreen are icebreakers which are used by other Federal agencies when available for polar related research.

<sup>5/</sup> No longer used for oceanographic research purposes.

**TABLE 2**  
**COST & UTILIZATION OF FEDERALLY FUNDED U.S. OCEANOGRAPHIC VESSELS**  
**1976-1977-1978**

Agency/Institution Operating Vessel	Vessel Name	Vessel	Operating	Days <sup>1/</sup>	Vessel	Cost Per	Day <sup>2/</sup>
		1976 (Actual)	1977 (Estimated)	1978 (Projected)	1976 (In thou- sands)	1977 (In thou- sands)	1978 (In thou- sands)
National Oceanic & Atmospheric Admin. (NOAA)	Oceanographer	181	172	180	11.6	13.8	14.5
	Discover	187	207	210	12.9	13.1	13.2
	Researcher	182	199	210	11.0	11.6	12.4
	Surveyor	193	220	210	12.1	10.8	12.6
	Fairweather	183	189	180	9.3	8.7	11.6
	Rainier	191	187	180	9.0	9.7	11.6
	Miller Freeman	192	248	250	7.8	6.4	7.5
	Wt. Mitchell	186	199	190	9.8	11.3	10.9
	Peirce	193	189	178	5.0	5.7	6.1
	Whiting	195	195	188	5.3	6.0	6.2
	McArthur	206	191	188	5.7	6.5	7.1
	Davidson	191	191	188	7.2	7.0	6.5
	Oregon II	221	244	250	2.9	3.0	3.4
	George S. Kales	198	194	200	3.6	4.5	4.6
	Albatross II	196	207	215	5.2	6.2	5.2
	Townsend Cromwell	187	249	250	3.5	3.7	3.4
	David Starr Jordan	203	245	250	3.0	3.6	3.8
	Belvedere II	171	235	215	3.8	3.7	4.3
	Farral	190	195	190	2.4	3.4	3.6
	Shude/Hock	364	336	380	1.6	2.5	2.0
	Oregon	184	197	189	1.8	1.8	2.0
	John N. Cobb	172	168	164	1.8	2.2	2.7
	Murre II	133	129	140	.9	1.2	1.3
George M. Bowers	139	99	Retired	.8	.6	Retired	
University National Oceanographic Laboratory System (UNOLS)	Melville	188	249	308	5.6	6.8	6.6
	Knorr	304	294	329	4.5	5.3	5.5
	351	304	300	5.5	6.3	6.6	
	Atlantic II	219	240	292	5.1	5.8	5.3
	Thomas Washington	195	196	255	5.4	5.0	5.5
	Thompson	253	211	238	3.9	5.7	5.5
	James M. Gillies	281	240	321	3.2	3.7	4.5
	Robert D. Conrad	309	325	300	3.1	2.8	3.9
	Vema	188	255	274	3.0	3.4	3.6
	Oceanus	145	251	225	3.2	3.9	4.2
	Ucoma	-	221	276	-	3.7	3.7
	Endeavor	297	365	321	2.9	2.3	2.8
	Moana Wave	280	275	270	3.2	3.8	3.8
	Gyre	243	254	255	2.8	3.2	3.5
	Columbus Iselin	261	259	311	3.3	3.6	3.0
	Kara Keoki	240	232	285	3.5	3.9	3.5
	Alpha Melix	298	225	353	2.0	2.5	2.5
	Esward	189	209	210	2.5	2.3	2.4
	Valero IV	117	150	180	3.3	2.0	1.9
	Ridgely Warfield	112	174	191	2.0	2.4	2.1
	Ellen B. Scripps	198	190	187	2.7	3.3	3.3
	Anona	111	194	200	2.0	2.0	2.0
	Coyuse	199	230	230	1.1	1.1	1.2
	Longhorn	104	207	210	1.5	.6	.6
	Blue Pin	148	152	156	.5	.4	.4
	Hoh	177	227	218	.7	.5	.6
	Omar	36	80	90	.8	.9	.8
	Henry	182	190	234	.7	.8	.7
	Coleman						

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Agency/Institution Operating Vessel	Vessel Name	Vessel	Operating	Days <sup>1/</sup>	Vessel	Cost Per	Day <sup>2/</sup>
		1976 (Actual)	1977 (Estimated)	1978 (Projected)	1976 (In thou- sands)	1977 (In thou- sands)	1978 (In thou- sands)
U.S. Navy/Military Sealift Command(MSC)	Hayes	247	163	210	9.9	14.4	17.6
	Bowditch	209	102	260	18.5	40.5	16.6
	Dutton	112	172	230	45.2	24.0	19.1
	Hess	-	-	168	-	-	34.7
	Hymen	189	244	168	11.8	12.3	20.3
	Harkness	112	264	234	19.8	13.2	18.1
	Chauvznet	230	248	280	12.0	14.4	14.8
	Bent	207	206	230	10.6	13.2	13.4
	Kane	213	242	230	11.3	10.9	14.9
	Wilkes	29	271	230	39.0	10.3	16.5
	Bartlett	231	192	192	8.5	10.6	13.5
	De Steiguer	212	234	179	7.6	8.4	13.5
	Lynch	232	168	217	7.6	11.6	12.1
	Mizer	171	221	218	14.3	12.1	13.4
	Kingsport	229	272	188	13.2	12.3	22.3
	Nyer	241	245	-	15.1	16	-
	Neptune	185	251	196	18.4	15.8	26.2
Aeolus	143	116	218	33.7	49.2	26.5	
United States Coast Guard (USCG)	Evergreen	164	185	192	4.7	4.3	4.5
	Acushnet	139	189	171	5.5	5.4	8.2
	Northwind	159	202	181	15.0	15.4	18.8
	Westwind	159	202	181	15.0	15.4	13.3
	Burton Island	159	202	181	15.0	15.4	11.8
	Glacier	223	137	146	16.9	36.2	36.3
	Polar Star	-	-	126	-	-	-
	Polar Sea	-	-	126	-	-	-
	-	-	-	-	-	-	-
Dept. Of Interior U.S. Geological Survey	Sea Sounder	115	163	174	7.6	11.1	6.9
	Samuel P. Lee	185	193	179	7.6	7.7	7.8
	Polaris	100	100	85	1.3	2.0	2.5

<sup>1/</sup> Based on available data furnished from the various agencies which use different accounting systems. (See page 14.)

<sup>2/</sup> Based on available data furnished from the various agencies which use different accounting systems. (See page 14.)

<sup>3/</sup> Two ships utilized simultaneously for wire drag obstacle surveys.